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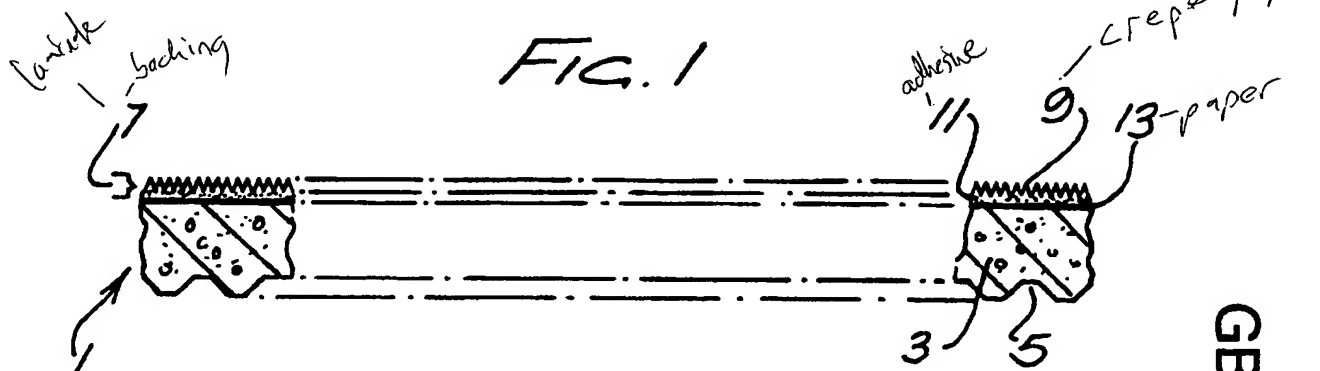
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(54) Carpet underlay and backing therefor

(57) A backing for a rubber or resilient polymeric carpet underlay comprises a layer of crepe paper or the like (9) laminated to a layer of non-stretch material (13) such as paper. The backing (7) is normally attached to the underlay which may be formed from ground rubber crumbs supported in a binder material, or of sponge rubber, or latex foam or a polyurethane foam and may be convoluted or ribbed. A release layer may be located on the side of the underlay opposite the backing (7) and it is preferred that the crepe paper (9) is uppermost.



Flat paper = nonwoven web

1/1

FIG. 1

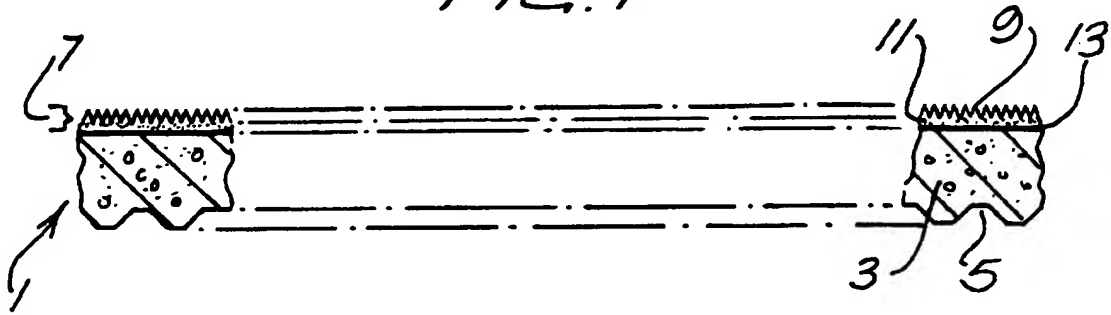


FIG. 2

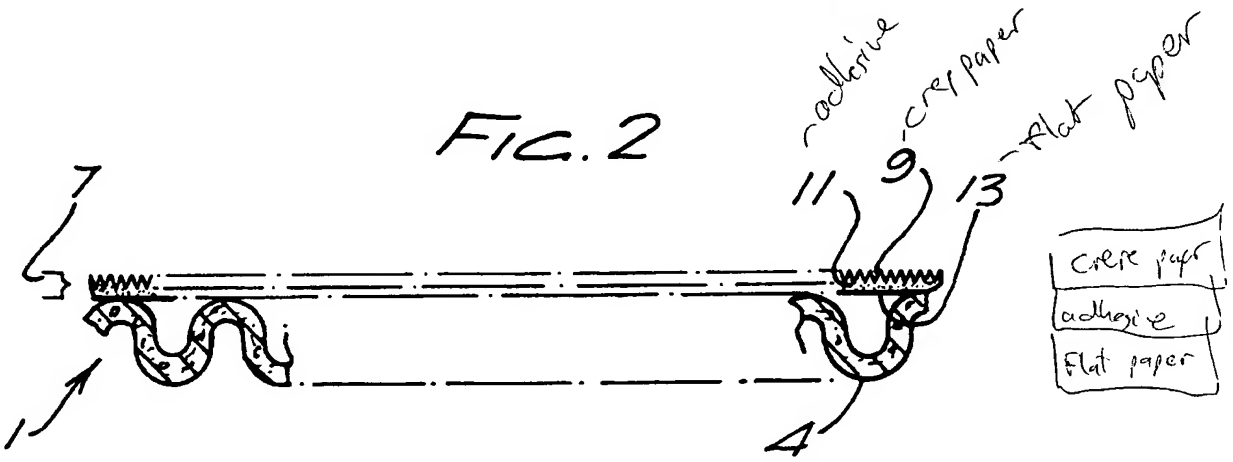


FIG. 3

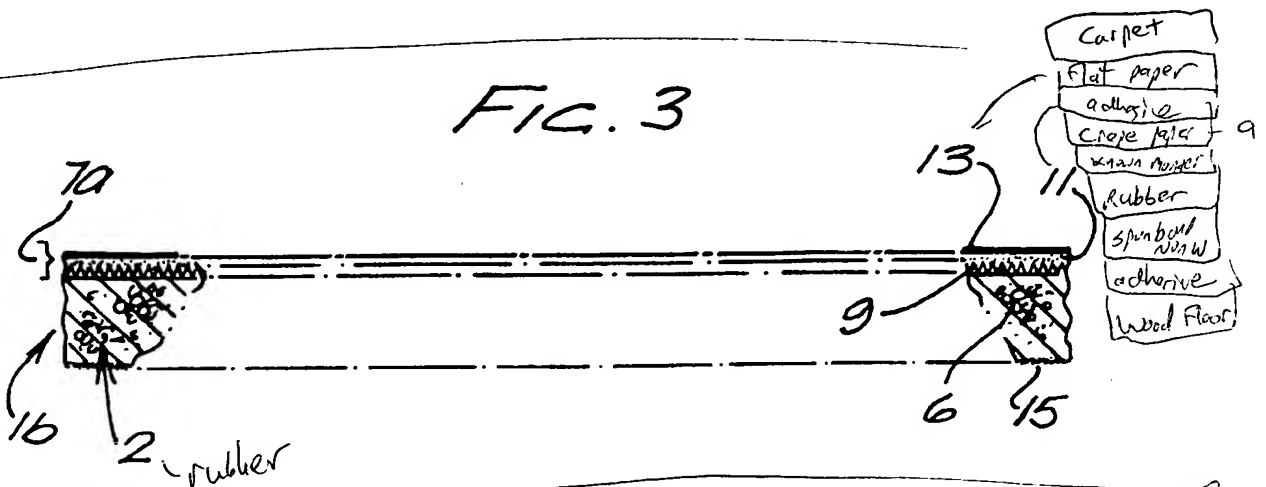
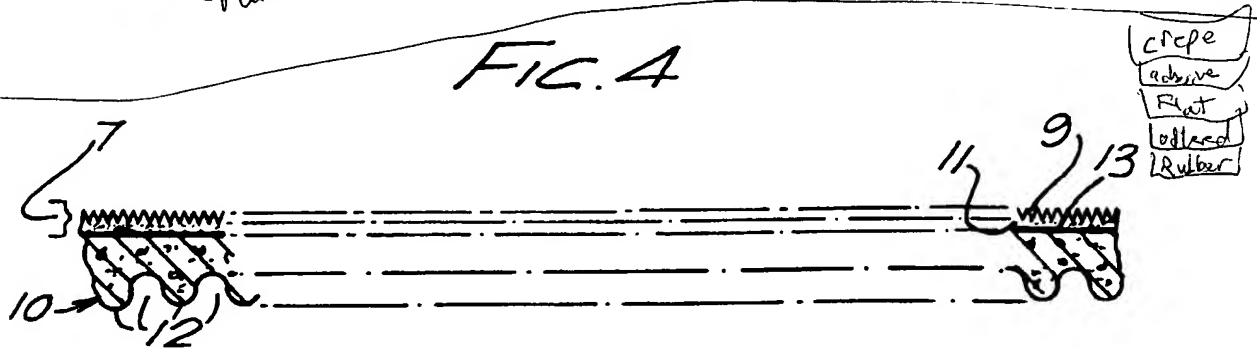


FIG. 4



CARPET UNDERLAY AND BACKING THEREFOR

This invention relates to carpet underlay, primarily
5 of the type which incorporates a layer of sponge rubber material, but also encompasses both latex foam and crumb rubber types, and to a backing for the underlay.

Carpet underlays commonly consist of a sponge rubber layer, which is most often in a convoluted or corrugated
10 form, together with a "backing" adhered to the upper side of the sponge rubber layer. The purpose of the backing is to act as a tensile member, giving reinforcement with respect to break strength, puncture resistance, lack of elongation under load and related properties. Without this tensile
15 layer, the carpet underlay would be difficult, or impossible, to handle.

Materials commonly used as backing include woven jute (hessian), non-woven textiles formed from glass, polyester or polypropylene fibres and stitched crepe craft paper. Of
20 these backing materials, the latter, often known TEXTRON (Registered Trade Mark), is the most common, particularly for high quality products.

TEXTRON stitched craft paper backing has been in production for about 20 years. Whilst details of its
25 specification have changed in minor respects over that period, its basic construction has remained, in principle, unaltered. The TEXTRON material consists of a crepe paper (which is corrugated by a wet or a dry process) into which a plurality of spaced rows of yarns (preferably of
30 polyester) have been stitched to provide a plurality of warps.—The warps cross the corrugations and prevent the backing stretching in this direction, whereas the wefts run parallel to or inclined at one or more angles to the corrugations, and prevent stretching in that direction. The
35 TEXTRON material has an attractive and textile-like appearance, is pleasant to handle, has sufficient bulk, and has an adequate level of physical properties such as tear, break and elongation resistance. However, it is relatively

expensive since the polyester stitching cost is high. The stitching process is slow and the yarn is costly when compared to the crepe paper part of the material.

This disadvantage is overcome in the present invention in which, according to the broadest aspect, we provide a backing for sponge rubber or like carpet underlay comprising a layer of crepe paper laminated to a layer of non-stretch material, preferably flat paper.

Preferably, the two layers are laminated using an adhesive of the PVA type (polyvinyl alcohol, modified with minor ingredients, and in emulsion form with water). wet laid

Preferably, the flat paper contains 80%, or more, of recycled pulp, whereas the creped paper contains between 20% and 50% of recycled pulp, the remainder being virgin pulp.

Also according to the present invention, we provide a carpet underlay comprising a sheet of rubber material having on its upper surface a backing as described above. The rubber material may be formed from ground rubber crumbs or granules, recycled from rubber tyres or other sources, supported in a resin latex or other binder material, or a polyurethane foam material, either in the form of a slab slit from virgin stock, or in reconstituted form (reconstituted chips bound with a binder, e.g. of polyurethane) or of similar construction, but is preferably sponge rubber or latex foam. This may be corrugated or convoluted, or ribbed or grooved.

In the case of sponge rubber, the unblown rubber compound has the backing adhered to its upper surface, prior to it being passed through a heating device, e.g. an oven, and to the solid compound being blown to form it into a sponge, followed by curing. If the sponge material is to be convoluted or corrugated, it is passed through the heating device on a chain mat.

In the case of latex foam, the foam material is spread on the backing and is normally flat. If a ribbed, grooved or wavy surface is desired, the foam material is spread flat on the backing with a contoured comb-like knife, which may be moved to and fro to give a wave-like form to the grooves

or waves.

The carpet underlay may have a facing on the side thereof opposite the backing to give release properties when used in fully adhered installation systems.

release layer

5 Creped paper on its own without stitching is of low cost and is acceptable to the consumer, but apart from
puncture resistance, does not have adequate physical
properties. In particular, its resistance to elongation is
very poor and the amount to which it stretches when subject
10 to load during underlay manufacture and in fitting is unacceptable. Ordinary flat, uncreped paper, on the other hand, is inexpensive and has the necessary physical properties, except puncture resistance which is poor, but is unacceptable to the consumer because it has poor handling
15 properties, low bulk, creases on flexing and is perceived to be of poor appearance. However, the present invention, which provides a backing formed of creped and uncreped paper laminated together, all of the required criteria are met simultaneously.

20 Several alternative embodiments of underlay according to the present invention are now described, by way of example only, with reference to the accompanying drawings, in which:-

FIGURE 1 is a section through a flat sponge rubber
25 underlay according to a first embodiment of the invention;

FIGURE 2 is a section through a convoluted sponge rubber underlay according to a second embodiment of the invention;

FIGURE 3 is a section through a flat rubber crumb
30 underlay according to a third embodiment of the invention; and

FIGURE 4 is a section through a patterned foam rubber underlay according to a fourth embodiment of the invention.

Referring to the drawings, like components in the
35 various views are identified by the same reference numerals.

In the embodiment of Figure 1, the underlay 1 is made from a sheet of flat sponge rubber 3 having a serrated or otherwise patterned lower surface 5, and a backing 7 in the

form of a laminate attached to its upper surface. The laminate 7 comprises an upper layer of crepe paper 9 attached with adhesive 11 to a sheet of flat paper 13. The flat paper 13 may be adhered directly to the rubber prior to
 5 curing, using the rubber itself as the adhesive, or a proprietary adhesive may be used for this purpose.

In the embodiment shown in Figure 2, the flat sponge rubber is replaced by a sheet of convoluted sponge rubber 4. This receives its convolutions by being passed through a
 10 curing oven on a chain mat. The flat paper 13 is secured to the tips of the convolutions with an adhesive (not shown) which could be the rubber material itself.

In the alternative embodiment shown in Figure 3, the underlay 1b is comprised of a flat sheet 2 made up of
 15 ground-up rubber crumbs or particles 6 bonded together with latex, on the upper surface of which is a backing made up of a laminate 7a; the laminate is formed of a flat sheet of paper 13 adhered with adhesive 11 to a crepe paper 9, the
crepe paper being secured in known manner to the crumb
 20 rubber sheet. On the underside of the crumb rubber sheet 2 is a facing 14 of spun bonded polyester. This is a known material, and allows the underlay easily to be released when
it is adhered to a floor, e.g. of concrete or wood by the
application of adhesive to the underside of the facing 15;
 25 when the underlay is pulled up, part of the facing 15 will remain adhered to the floor, and part to the underside of the flat sheet 2, and very little, if any, of the sheet 2 will remain adhered to the floor.

In the fourth embodiment of the invention shown in
 30 Figure 4, the upper part of the underlay is formed of a crepe paper 9, adhesive 11, flat paper 13, and laminate 7
adhered to a foam rubber sheet 10 in known manner. The sheet 10 has a ribbed or otherwise patterned underface 12.

In all the embodiments, the flat sheet of paper 13,
 35 which could be replaced with another sheet or web of non-stretch material, prevents the crepe paper 9 from stretching. This therefore gives stability to the whole underlay. The crepe paper 9, on the other hand, provides

Known manner
adhered =

-wood

bulk, has a pleasant appearance, and is puncture resistant.

In the embodiments of Figures 1, 2 and 4, the flat paper 9 and the crepe paper 13 could be inverted with respect to each other, and the same applies to the construction shown in Figure 3. It is preferred, however, that the crepe paper 9 be uppermost, since this has greater consumer appeal, and provides the necessary strength and resistance to damage.

The release layer or facing 15 shown in Figure 3 is only a preferred feature. It may also be provided in the embodiments of Figures 1, 2 and 4.

A sample backing has been achieved in early trials by a simple lamination process in which the two layers making up the laminate 7 were combined using a PVA (aqueous suspension of polyvinyl alcohol) adhesive applied by hand. A flat paper 13 of 37g/m^2 weight made from 80% recycled/20% virgin pulp was laminated by hand to 72g/m^2 crepe paper 13 produced from a 37g/m^2 base which contained 20% recycled/80% virgin pulp. Adhesive 11 was applied to the flat paper by hand, the crepe paper 13 was laminated to it, and the composite dried under pressure. This backing or laminate 7 was applied to an appropriate sponge rubber compound which was passed through an oven, supported by a chain mat to cause it to become convoluted, blown to a sponge, and cured. The product illustrated in Figure 2 was judged to have excellent physical properties and was believed to be very acceptable to consumers.

Moreover, with respect to cost, the two component papers for making the laminate 7 or 7a are available at appropriate weights for less than half the cost of stitched crepe paper sold as TEXTRON. The cost of the lamination is known to be very low. In the case of wet creping in particular, the process uses drying and pressure rollers so that lamination can be introduced "in-line" without an additional step, and in the case of a starch based adhesive, possibly without even extra material cost.

It will be understood that many variations from the embodiments described with reference to the drawings are

possible. Both crepe and flat papers can be of any appropriate weight and degree of creping, and the finish and other characteristics can be varied. Virgin pulp, recycled pulp or modified conventional paper formulations containing, for example, polypropylene fibres to enhance tensile and tear strength, can be used for both the crepe and the flat paper. The crepe paper can be replaced by other paper types similarly treated to texturise, "bulk-up" and improve puncture resistance, e.g. by embossing, punching, grooving, etc., and the term "crepe" paper should be interpreted accordingly. Furthermore, a wide variety of adhesives will be acceptable. These include starch-based products widely used within the paper industry, thermoplastic types, and a variety of glass and resins from natural sources. Lamination may also be carried out mechanically by punching as in a needle felting process or similar fashion. It is also envisaged that the flat paper could be replaced by other types of flat sheet or web-like material.

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CLAIMS:

1. A backing for sponge rubber or like carpet underlay comprising a layer of crepe paper laminated to a layer of
5 non-stretch material.
2. A backing according to claim 1, wherein the non-stretch material is flat paper.
- 10 3. A backing according to claim 1 or 2, wherein the two layers are laminated using an adhesive of the PVA type.
4. A backing according to claim 2 or claim 3 when dependent on claim 2, wherein flat paper contains at least
15 80% of recycled pulp, whereas the creped paper contains between 20% and 50% of recycled pulp, the remainder being virgin pulp.
5. A backing according to claim 1, and substantially as
20 hereinbefore described.
6. A carpet underlay comprising a web of rubber or resilient polymeric material having on its upper surface a backing as claimed in any one of claims 1-5.
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7. A carpet underlay according to claim 6, wherein the rubber material is formed from ground rubber crumbs or granules, recycled from rubber tyres or other sources, supported in a resin binder material.
30
8. A carpet underlay according to claim 6, wherein the rubber material is sponge rubber.
9. A carpet underlay according to claim 6, wherein the
35 rubber material is latex foam.
10. A carpet underlay according to claim 6, in which the resilient polymeric material is a polyurethane foam.

11. A carpet underlay according to claim 8, 9 or 10, wherein the sponge rubber, latex foam or polyurethane foam is corrugated or convoluted.

5

12. A carpet underlay according to claim 8, 9 or 10, wherein the rubber or polyurethane foam material is ribbed or grooved.

10 13. A carpet underlay according to claim 11, wherein, when the rubber material is sponge rubber, the unblown rubber compound has the backing adhered to its upper surface, prior to it being passed through a heating device, e.g. an oven, and to the solid compound being blown to form
15 it into a sponge, followed by curing.

14. A carpet underlay according to claim 13, wherein the sponge material is passed through the heating device on a chain mat so that it becomes convoluted or corrugated.

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15. A carpet underlay according to claim 11, wherein, if the rubber material is latex foam, the foam material is spread on the backing and when a ribbed, grooved or wavy surface is desired, the foam material is spread flat on the
25 backing with a contoured comb-like knife, which may be moved to and fro to give a wave-like form to the grooves or waves.

16. A carpet underlay according to any one of claims 6-15, wherein a facing on the side thereof opposite the
30 backing is provided to give release properties.

17. A carpet underlay substantially as hereinbefore described with reference to Figure 1 or Figure 2 or Figure 3 or Figure 4 of the accompanying drawings.

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Claims searched: 1 to 17

Examiner: R.J.MIRAMS
Date of search: 14 June 1996

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
 UK CI (Ed.O): A4S, B5N
 Int CI (Ed.6): A47G 27/04; B32B 3/28, 29/00, 29/02; D06N 7/00
 Other: ONLINE: WPI, CLAIMS

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB2,257,088A (Scott & Fyfe) whole document	at least 1, 2, 6, 8, 9
X	GB2,209,351A (Scott & Fyfe) e.g.page 5 lines 29 to 30	at least 1, 2, 6, 8, 9, 11
X	GB2,209,350A (Scott & Fyfe) e.g.page 5 lines 24 to 30	at least 1, 2, 6, 8, 9, 11
X	GB2,182,071A (Scott & Fyfe) e.g.claims 12 and 13	at least 1, 2, 6, 8, 9, 11
X	GB1,419,948A (Uniroyal) e.g.page 3 lines 41 to 77	at least 1, 6, 8, 9, 11
X	GB0,862,545A (Kimberly-Clark) e.g. page 2 lines 62 to 82	at least 1
X	US3,775,231A (Thomas) e.g. column 4 line 60 to column 5 line 63	at least 1
A,E	WO95/13919A1 (Carrs Paper)	

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